

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-154348

(43)Date of publication of application : 22.06.1993

(51)Int.Cl.

B01D 53/36
F01N 3/08

(21)Application number : 03-324550

(71)Applicant : TDK CORP

(22)Date of filing : 09.12.1991

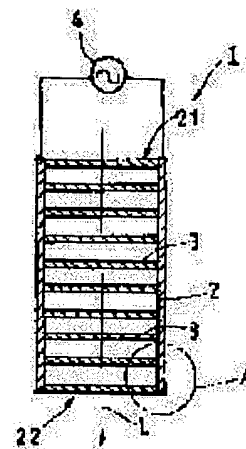
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(54) DEODORIZING DEVICE

(57)Abstract:

PURPOSE: To enhance not only deodorizing efficiency but also deodorizing capacity.

CONSTITUTION: In a deodorizing device, many heaters 3 are arranged in a container 2 so as to cross an air flow direction L at a right angle and the power supply 4 heating the respective heaters 3 is mounted. The heaters 3 have many air passages in a lattice or honeycomb state and also have a deodorizing catalyst bonded to the surfaces thereof. An AC current of 100V is supplied to the container 2 from a power supply 4 and air to be deodorized is taken in the container 2 from a taking-in port 21 by a fan. The air taken in the container 2 is heated to about 150°C by the heaters 3 and the offensive smell component in said air is decomposed by the deodorizing catalyst bonded to the surfaces of the heaters 3 and the air after deodorizing is discharged from a discharge port 22. By this constitution, a tobacco smell or the sweat smell from a human body such as an ammonia smell incapable of being decomposed heretofore at room temp. can be oxidized and decomposed to be deodorized.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the
examiner's decision of rejection or application
converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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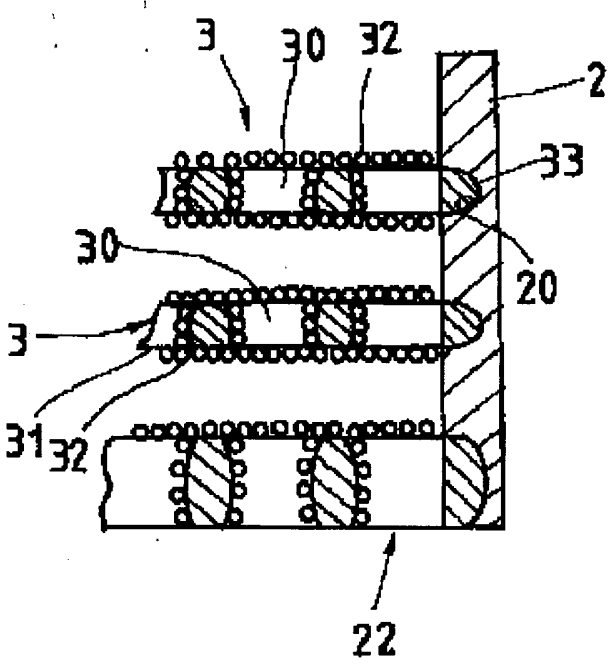


Figure 2

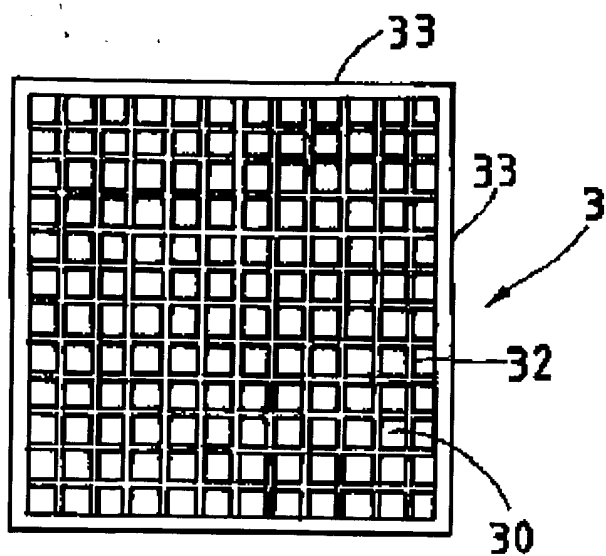


Figure 3

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the suitable deodorization equipment for the deodorization in the bedding oven used indoors, a tableware oven, a warm air machine, a heater, etc., decomposition of the exhaust gas of an automobile, etc.

[0002]

[Description of the Prior Art] Although conventional deodorization equipment decomposes the odor component in air with a deodorization catalyst object and it deodorizes, especially deodorization was not performed under heating.

[0003]

[Problem(s) to be Solved by the Invention] As mentioned above, since deodorization was not performed under heating, conventional deodorization equipment had the problem that **** which comes out from the bodies, such as a smell, an ammonia smell, etc. of tobacco, could not be deodorized.

[0004] Then, this invention aims at offering the deodorization equipment which aimed at improvement in deodorization capacity while it is made in view of the above-mentioned situation and aims at improvement in deodorization effectiveness.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention according to claim 1 is formed so that it may have many ventilation flues, and is characterized by having the heating element which comes to adhere to a front face in a deodorization catalyst object, and the power source which heats this heating element.

[0006] Moreover, in deodorization equipment according to claim 1, as for invention according to claim 2, many ventilation flues are formed the shape of a grid, and in the shape of a honeycomb, as for a heating element.

[0007] Moreover, invention according to claim 3 uses a heating element as a forward temperature characteristic thermistor in deodorization equipment according to claim 1 or 2.

[0008]

[Function] According to invention according to claim 1, a heating element is heated according to a power source, and if the ventilation flue of a large number formed in the heating element is made to pass air, a deodorization catalyst object will deodorize efficiently under heating. Thereby, the odor component which was not able to be decomposed in ordinary temperature can also be decomposed now.

[0009] According to invention according to claim 2, by making a heating element into the shape of the shape of a grid, and a honeycomb, the touch area of the air and the deodorization catalyst object which pass through a ventilation flue increases, and it can deodorize more efficiently.

[0010] According to invention according to claim 3, by using a heating element as a forward temperature characteristic thermistor, temperature management becomes easy and stable deodorization can be performed.

[0011]

[Example] Hereafter, the example of this invention is explained in full detail with reference to a drawing.

[0012] The outline block diagram in which drawing 1 shows one example of the deodorization equipment of this invention, and drawing 2 are the expanded sectional views of the A section shown in drawing 1. This equipment 1 arranges two or more heating elements 3 so that it may intersect perpendicularly in the ventilation direction L in a container 2, it possesses the power source 4 which heats each heating element 3, and a heating element 3 is formed so that it may have many ventilation flues 30, and it comes to adhere to a front face 31 in the deodorization catalyst object 32.

[0013] Said container 2 consists of a conductive member, for example, it has square tubed, the concave 20 for fitting in

the polar zone 33, such as nickel formed around the heating element 3, is formed, and the polar zone 33 of a heating element 3 is joined to this concave 20 by electroconductive glue etc. Moreover, a container 2 forms the intake 21 for incorporating the air for deodorization in a container 2 by a fan (illustration abbreviation) etc. at the end, and forms the exhaust port 22 for discharging the air after deodorizing to the other end.

[0014] As the configuration of said heating element 3 is shown in drawing 3, it has about 0.5mm of thickness, and the shape of a square whose one side is 10mm, and many ventilation flues 30 whose magnitude is about 1 thru/or 1.2mm are formed the shape of a grid, and in the shape of a honeycomb. Although the shape of this shape of a grid and a honeycomb is excellent in respect of deodorization effectiveness, the configuration equipped with much HIDA is sufficient. In order to perform efficient deodorization, it changes with wind speeds which pass through a ventilation flue 30, thickness is good like this example at about 0.5mm, when wind speeds are 1m thru/or 2 m/s, and when wind speeds are 5m thru/or 10 m/s, it should just make thickness 2 thru/or about 3 times. Moreover, if too large, it becomes impossible to be unable to deodorize, and since a wind speed is restricted if too small, in consideration of deodorization effectiveness etc., it is necessary to make magnitude of each ventilation flue 30 into moderate magnitude like this example.

[0015] Moreover, ~~the heating element 3 is used as forward temperature characteristic (PCT) thermistors, such as for example, a barium titanate system (BaTiO₃ ceramic), a zinc-oxide system (ZnO-NiO-TiO₂ ceramic), and a lead oxide system (PbO₃ ceramic), by this example.~~ In addition, although resistance heating elements, such as a nichrome wire, a tungsten, and molybdenum, are sufficient, in order to make it generate heat at the stable temperature if it has many ventilation flues 30, this forward temperature characteristic thermistor is desirable. Namely, if the temperature of the object itself reaches at a curie point, as for a forward temperature characteristic thermistor, generation of heat by which resistance increases rapidly and a current is controlled and which was stabilized by this will be acquired. Therefore, by changing the ingredient of a forward temperature characteristic thermistor suitably, a curie point can be changed and the exoergic temperature which becomes fixed can change like 150 degrees C and 200 degrees C.

[0016] Said deodorization catalyst object 32 mixes particle size (several micrometers which mixed oxide, such as manganese oxide (MnO₂) and titanium oxide (TiO₂), thru/or hundreds of micrometers) of fine particles with a binder (organic substance of a cellulose system). It is immersed in the deodorization catalyst object 32 of a liquefied condition, and a heating element 3 is made to adhere to the front face 31 of a heating element 3 at it (dipping method). In addition, it is good also by the spray or nonelectrolytic plating as an approach of making the deodorization catalyst object 32 adhering to the front face 31 of a heating element 3. In addition, although the deodorization catalyst object 32 was made to adhere to all the front faces 31 of a heating element 3, you may make it adhere only to the near field and near ventilation flue 30 where a wind hits.

[0017] Not only an alternating current but DC power supply are sufficient as said power source 4, and a dry cell and a solar battery are sufficient as it. By considering as a dry cell, it becomes a portable thing, and by considering as a solar battery, it can carry and becomes a maintenance free in respect of a changing battery.

[0018] Next, an operation of the deodorization equipment 1 of the above-mentioned configuration is explained.

[0019] Alternating current 100V are supplied to a container 2 from a power source 4, and the air for deodorization is adopted in a container 2 from the intake 21 of the end of a container 2 by a fan (illustration abbreviation) etc. And with a heating element 3, it becomes hot to about 150 degrees C, the odor component in air is decomposed by the deodorization catalyst object 32 to which the front face 31 of a heating element 3 adhered, and, as for the air incorporated in the container 2, the air after deodorization is discharged from the exhaust port 22 of the other end of a container 2.

[0020] According to such above-mentioned deodorization equipment 1, since it was made to deodorize under heating, conventionally, in ordinary temperature, the oxidative degradation of the **** from the bodies, such as a smell, an ammonia smell, etc. of tobacco, which was not able to be decomposed can be carried out, and it could be deodorized.

[0021] The effectiveness mentioned above is clear also from the graph which shows the deodorization effectiveness of this deodorization equipment 1 of drawing 4. That is, this drawing was what measured the rate of the acetic acid contained in the air of the back before passing this deodorization equipment 1 with the gas sensor, and although it could decompose only by making it an elevated temperature, and the no less than 300 degrees C elevated temperature was required for the acetic-acid smell, it could remove [after / energization / 1 hour and a half] even the temperature of 150 degrees C about 90% in s in 1m of wind speeds, and 2m /by using this deodorization equipment 1.

[0022] Moreover, since a drier for home use, not only a warm air machine, etc. but the hydrocarbon contained in the exhaust gas of an automobile can be decomposed into carbon dioxide gas and water according to this deodorization equipment 1, the adaptation to emission control is also attained, as a result air pollution is prevented, and it can contribute to public-benefit protection.

[0023] in addition, this invention is not limited to the above-mentioned example, but is variously boiled within limits which do not change the summary, and deformation implementation is possible for it.

[0024]

[Effect of the Invention] According to this invention explained in full detail above, the following effectiveness is done so.

[0025] Since according to invention according to claim 1 are formed so that it may have many ventilation flues, and the heating element which comes to adhere to a front face in a deodorization catalyst object is made to heat and it is deodorizing, while aiming at improvement in deodorization effectiveness, the deodorization equipment which also aimed at improvement in deodorization capacity can be offered.

[0026] According to invention according to claim 2, since the heating element is made into the shape of the shape of a grid, and a honeycomb, rather than invention according to claim 1, the touch area of the air and the deodorization catalyst object which pass through a ventilation flue increases, and improvement in deodorization effectiveness can be aimed at more.

[0027] According to invention according to claim 3, since the heating element is used as the forward temperature characteristic thermistor, in addition to effectiveness according to claim 1 or 2, temperature management becomes easy and stable deodorization can be performed.

[Translation done.]

DERWENT- 1993-231631
ACC-NO:

DERWENT- 199329
WEEK:

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TITLE: Deodorising appts. for e.g. room heater - comprises vessel contg.
air conduits provided with heater coated with deodorising catalyst,
and electric source for heater

PATENT-ASSIGNEE: TDK CORP[DENK]

PRIORITY-DATA: 1991JP-0324550 (December 9, 1991)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 05154348	A June 22, 1993	N/A	004	B01D 053/36

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 05154348	A N/A	1991JP-0324550	December 9, 1991

INT-CL (IPC): B01D053/36, F01N003/08

ABSTRACTED-PUB-NO: JP 05154348A

BASIC-ABSTRACT:

The appts. comprises vessel contg. many air conduits on which a heater adhering
a deodorising catalyst, are provided; and an electric source to heat.

Conduits are made pref. in form of lattice or honeycomb. Heater is pref.
thermistor having a positive temp. characteristic.

USE/ADVANTAGE - The appts. is used for deodorising in dryer of mats, plates,
air-warmer, heater for room, etc. or decomposition of an exhaust gas. The
efficiency and power of deodorising is remarkably improved by deodorising at a
hot condition.

CHOSEN- Dwg.0/4
DRAWING:

TITLE- DEODORISE APPARATUS ROOM HEATER COMPRISE VESSEL CONTAIN AIR CONDUIT
TERMS: HEATER COATING DEODORISE CATALYST ELECTRIC SOURCE HEATER

DERWENT-CLASS: D22 J04 Q51

CPI-CODES: D09-B; J01-E02D; J01-E03F;

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1993-102753

Non-CPI Secondary Accession Numbers: N1993-178245

(19)日本国特許庁(JP)

(12)公開特許公報(A)

(11)特許出願公開番号

特開平5-154348

(43)公開日 平成5年(1993)6月22日

(51)Int.Cl.⁵

B01D 53/36

F01N 3/08

識別記号

庁内整理番号

H 9042-4D

A 7910-3G

FI

技術表示箇所

審査請求 未請求 請求項の数3(全4頁)

(21)出願番号 特願平3-324550

(22)出願日 平成3年(1991)12月9日

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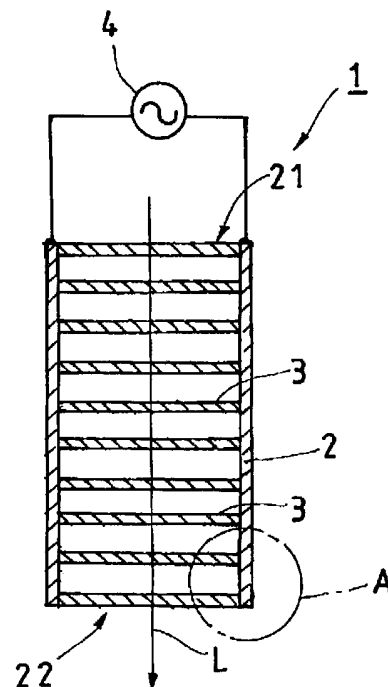
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(54)【発明の名称】 脱臭装置

(57)【要約】

【目的】 脱臭効率の向上を図ると共に、脱臭能力の向上を図る。

【構成】 本装置1は、容器2内に通風方向Lに直交するように複数の発熱体3を配置し、各発熱体3を加熱する電源4を具備する。発熱体3は、多数の通風路が格子状又はハニカム状に形成され、表面に脱臭触媒体を付着してなるものである。電源4から交流100Vを容器2に供給し、脱臭対象の空気をファン等により取入口21から容器2の内側に取り入れる。容器2内に取り込まれた空気は、発熱体3により150℃近くまで熱せられ、発熱体3の表面に付着された脱臭触媒体により空気中の臭気成分が分解され、脱臭後の空気が排出口22から排出される。これにより、従来常温では分解できなかったタバコの臭やアンモニア臭等の人体からの汗臭等も酸化分解でき、脱臭できるようになる。



【特許請求の範囲】

【請求項1】 多数の通風路を有するように形成され、表面に脱臭触媒体を付着してなる発熱体と、この発熱体を加熱する電源とを有することを特徴とする脱臭装置。

【請求項2】 前記発熱体は多数の通風路が格子状又はハニカム状に形成された請求項1記載の脱臭装置。

【請求項3】 前記発熱体を正温度特性サーミスタとした請求項1又は2記載の脱臭装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、室内で使用されるふとん乾燥器、食器乾燥器、温風器、暖房器等における脱臭や自動車の排気ガスの分解等にも好適な脱臭装置に関する。

【0002】

【従来の技術】従来の脱臭装置は、空気中の臭気成分を脱臭触媒体により分解して脱臭するものではあるが、特に加熱下で脱臭は行われていなかった。

【0003】

【発明が解決しようとする課題】上述したように従来の脱臭装置は、加熱下で脱臭が行われていなかったため、たばこの臭いやアンモニア臭等の人体から出てくる汗臭等を脱臭できないという問題があった。

【0004】そこで、本発明は、上記事情に鑑みてなされたものであり、脱臭効率の向上を図ると共に、脱臭能力の向上を図った脱臭装置を提供することを目的とする。

【0005】

【課題を解決するための手段】上記目的を達成するために請求項1記載の発明は、多数の通風路を有するように形成され、表面に脱臭触媒体を付着してなる発熱体と、この発熱体を加熱する電源とを有することを特徴とするものである。

【0006】また、請求項2記載の発明は、請求項1記載の脱臭装置において、発熱体は多数の通風路が格子状又はハニカム状に形成されたものである。

【0007】また、請求項3記載の発明は、請求項1又は2記載の脱臭装置において、発熱体を正温度特性サーミスタとしたものである。

【0008】

【作用】請求項1記載の発明によれば、発熱体を電源により加熱し、空気を発熱体に形成された多数の通風路に通過させると、脱臭触媒体は加熱下で効率良く脱臭を行う。これにより、常温で分解できなかった臭気成分も分解できるようになる。

【0009】請求項2記載の発明によれば、発熱体を格子状又はハニカム状とすることにより通風路を通過する空気と脱臭触媒体との接触面積が増大し、より効率良く脱臭が行える。

【0010】請求項3記載の発明によれば、発熱体を正

温度特性サーミスタとすることにより、温度管理が容易となり、安定した脱臭が行える。

【0011】

【実施例】以下、本発明の実施例を図面を参照して詳述する。

【0012】図1は本発明の脱臭装置の一実施例を示す概略構成図、図2は図1に示すA部の拡大断面図である。本装置1は、容器2内に通風方向Lに直交するように複数の発熱体3を配置し、各発熱体3を加熱する電源4を具備するものであり、発熱体3は、多数の通風路30を有するように形成され、表面31に脱臭触媒体32を付着してなるものである。

【0013】前記容器2は、導電性部材からなり例えば正方形筒状を有し、発熱体3の周辺に形成されたNi等の電極部33を嵌合するための凹溝20を形成しており、発熱体3の電極部33は、導電性接着剤等によりこの凹溝20に接合される。また、容器2は、一端に脱臭対象の空気をファン（図示省略）等により容器2内に取り込むための取入口21を形成し、他端に脱臭後の空気を排出するための排出口22を形成している。

【0014】前記発熱体3の形状は、図3に示すように、厚約0.5mm、一辺が10mmの正形状を有し、大きさが約1乃至1.2mmの多数の通風路30が格子状又はハニカム状に形成されたものである。この格子状又はハニカム状が脱臭効率の点で優れているが、その他ヒダを多数備えた形状でもよい。厚さは、効率の良い脱臭を行うためには、通風路30を通過する風速により異なるものであり、風速が1m乃至2m/sの場合は、本実施例の如く0.5mm程度でよく、風速が5m乃至10m/sの場合は、厚さを2乃至3倍程度にすればよい。また、各通風路30の大きさは、大きすぎるとは脱臭しきれなくなり、小さすぎるとは風速が制限されるため、脱臭効率等を考慮して、本実施例の如く適度の大きさとする必要がある。

【0015】また、発熱体3は、本実施例では例えば、チタン酸バリウム系(BaTiO₃セラミック)、酸化亜鉛系(ZnO-NiO-TiO₂セラミック)、酸化鉛系(PbO₃セラミック)等の正温度特性(PCT)サーミスタとしている。その他、多数の通風路30を備えるものであるならば、ニクロム線、タングステン、モリブデン等の抵抗発熱体でもよいが、安定した温度で発熱させるためには、この正温度特性サーミスタが望ましい。すなわち、正温度特性サーミスタは、その物自体の温度がキュリー点に達すると急激に抵抗値が増大して電流が抑制される、これにより安定した発熱が得られる。従って、正温度特性サーミスタの材料を適宜変えることによりキュリー点を変えることができ、一定となる発熱温度が例えば150℃、200℃の如く変更できる。

【0016】前記脱臭触媒体32は、酸化マンガナ(MnO₂)、酸化チタン(TiO₂)等の酸化物を混合し

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た数 μm 乃至数百 μm の粒径の粉体をバインダー（セルロース系の有機物）で混合したものである。液状状態の脱臭触媒体32に発熱体3を浸漬して、発熱体3の表面31に付着させる（ディッピング法）。その他、脱臭触媒体32を発熱体3の表面31に付着させる方法として、スプレーや無電解めっきによってもよい。なお、脱臭触媒体32は発熱体3の全表面31に付着させたが、風が当たる側の面及び通風路30にのみ付着させてもよい。

【0017】前記電源4は、交流に限らず直流電源でもよく、乾電池や太陽電池でもよい。乾電池とすることにより、携帯可能なものとなり、太陽電池とすることにより、携帯可能で電池交換の点でメンテナンスフリーとなる。

【0018】次に上記構成の脱臭装置1の作用を説明する。

【0019】電源4から交流100Vを容器2に供給し、脱臭対象の空気をファン（図示省略）等により容器2の一端の取入口21から容器2内に取り入れる。そして、容器2内に取り込まれた空気は、発熱体3により例

えば150℃近くまで熱せられ、発熱体3の表面31に付着された脱臭触媒体32により空気中の臭気成分が分解され、脱臭後の空気が容器2の他端の排出口22から排出される。

【0020】このような上記脱臭装置1によれば、加熱下で脱臭を行うようにしているので、従来常温では分解できなかったたばこの臭やアンモニア臭等の人体からの汗臭等も酸化分解でき、脱臭できるようになった。

【0021】上述する効果は、図4の本脱臭装置1の脱臭効果を示すグラフからも明らかである。すなわち、同図は本脱臭装置1を通過する前と後の空気中に含まれる酢酸の割合をガスセンサーで測定したもので、酢酸臭は、高温にするだけで分解が可能であるが、300℃もの高温が必要であるが、本脱臭装置1を用いることにより、150℃の温度でも風速1m乃至2m/sで通電後1時間半で約90%除去できるようになった。

【0022】また、本脱臭装置1によれば、家庭用の乾

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燥器、温風器等に限らず、自動車の排気ガスに含まれるハイドロカーボンも炭酸ガスと水に分解できるので、排ガス規制への適合も可能となり、ひいては大気汚染を防止して公益保護に寄与し得るものとなる。

【0023】なお、本発明は上記実施例に限定されず、その要旨を変更しない範囲内で種々に変形実施可能である。

【0024】

【発明の効果】以上詳述した本発明によれば、以下の効果を奏する。

【0025】請求項1記載の発明によれば、多数の通風路を有するように形成され、表面に脱臭触媒体を付着してなる発熱体を加熱させて脱臭しているので、脱臭効率の向上を図ると共に脱臭能力の向上をも図った脱臭装置を提供することができる。

【0026】請求項2記載の発明によれば、発熱体を格子状又はハニカム状としているので、請求項1記載の発明よりも通風路を通過する空気と脱臭触媒体との接触面積が増大し、より脱臭効率の向上が図れる。

【0027】請求項3記載の発明によれば、発熱体を正温度特性サーミスタとしているので、請求項1又は2記載の効果に加え、温度管理が容易となり、安定した脱臭が行える。

【図面の簡単な説明】

【図1】本発明の脱臭装置の一実施例を示す概略構成図である。

【図2】図1に示すA部の拡大断面図である。

【図3】図1に示す装置の発熱体の平面図である。

【図4】本発明の脱臭装置の脱臭効果を示すグラフである。

【符号の説明】

1 脱臭装置

3 発熱体

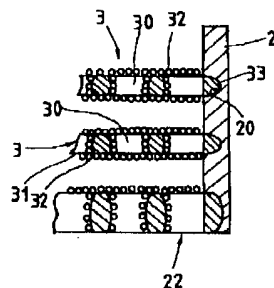
4 電源

30 通風路

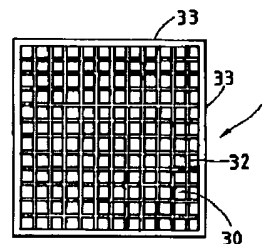
31 発熱体の表面

32 脱臭触媒体

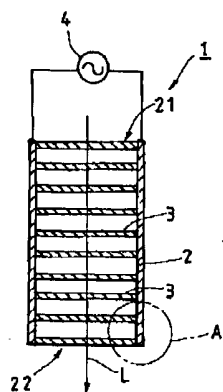
【図2】



【図3】



【図1】



【図4】

